An Assessment of the State of Competition in the Airline Industry*

Statement of

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Introduction

From time to time since airlines were deregulated over 20 years ago, the question of the functioning of airline markets arises. For example, seven years ago, after four years of staggering losses, a national commission was formed to investigate whether the deregulated airline industry was capable of achieving financial viability.[1] The industry's fortunes improved without any regulatory intervention and for the last several years it has been recording record profitability. Recently, concern has shifted from the plight of airlines to a concern for their passengers. This testimony summarizes recent empirical analyses I have undertaken to address the state of competition in the airline industry.

The Big Picture

Figure 1 shows the trend in the number of "effective competitors"[2] at the route level from 1977, the year before formal deregulation, through 1999. The number of carriers per route averaged about 1.7 in 1977 and rose to about 2.5 by 1986. Following the merger wave of the mid-1980s and bankruptcies in the early 1990s, the number of effective competitors per route has been fairly constant since 1993 at 2.2, an increase of more than 30 percent since 1977.

In addition, however, to the number of carriers on a route, the identity and business models of those carriers are also important, especially if one's ultimate interest is the effect of competition on fares. Figure 2 shows two measures of the influence of low-fare carriers. The first measure is the percentage of domestic passenger miles flown by low-fare carriers. This measure increased steadily from 1978 until 1985, declined in 1986 with the bankruptcy/merger of People Express and has grown steadily since 1987. In 1999 low-fare carriers accounted for 12 percent of domestic passenger miles, the highest percentage ever.[3] The second measure, however, gives a more accurate picture of the effect that low-fare carriers have on airline competition and fares. This measure takes into account that the influence of low-fare carriers is greater than their share of traffic

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[1] The National Commission to Ensure a Strong Competitive Airline Industry, *Change, Challenge and Competition: A Report to the President and the Congress*, August 1993.

[2] Because a simple count of carriers on a route would treat a carrier with a large market share of equal importance as one with a small market share, a measure of competition that takes market share into account is appropriate. In particular, I use the inverse of the widely used Herfindahl-Hirshman index (HHI), which equals the sum of the square of each firm's market share. Thus, if two carriers each had a 50 percent market share, the HHI would be $0.50^2 + .050^2 = 0.50$. Inverting gives two equal-sized competitors. The same result would occur with three carriers with market shares of two-thirds, one-sixth, and one-sixth.

[3] About two-thirds of the passenger miles flown by low-fare carriers are accounted for by Southwest Airlines. Although the passenger miles of other low-fare carriers were at an all-time high in 1999, their *share* of passenger miles (4.0%) was slightly less than in 1997 (4.1%) when it reached an all-time high.

because they influence fares of other carriers flying the same routes (in this case, the same city pair). In particular, it measures the percentage of domestic passenger miles flown (by all carriers) in city-pair markets that are served by low-fare carriers. This measure follows the same pattern as the previous one: increasing until 1985, declining until 1987 and increasing since then. In 1999, low-fare carriers influenced fares on routes accounting for 42 percent of domestic passenger miles, an all time high.[4] In addition, using a broader measure of the effect of low-fare carriers that incorporates the effect of actual route competition, competition on nearby routes, and the effect of potential competition, I have found that Southwest Airlines alone affects airfares on routes that account for 94 percent of U.S. domestic passenger miles.[5]

Interest in the extent of competition in the industry stems from the observation that more competition—especially from low-fare carriers—leads to lower fares. This is addressed directly in Figure 3, which shows domestic airline yield (average fare per mile) from 1970 to 1999. Fares, adjusted for inflation, have fluctuated, but followed a declining path since 1971. Compared with 1976, before the regulatory reform that preceded deregulation in 1978, fares have fallen 40 percent. In 1999, real yield was a bit less then 14 cents, its lowest level ever. However, as shown in the figure, fares were falling even before deregulation. How much of the decline in fares is due to deregulation and how much would have happened anyway (due to factor prices and technological change, for example)? This is addressed in Figure 4, which shows a conservative estimate of how much lower fares are due to deregulation.[6] For the last six years fares have been about 27 percent lower than they would have been if they were regulated. (Thus, about two-thirds (27/40) of the fare decline since 1976 can be attributed to deregulation.) Further investigation shows that 80 percent of passengers, accounting for 85 percent of passenger miles, pay lower fares than the estimate of regulated fares.

Deregulation has also affected service. Previous research has found that travelers have gained substantially from the increase in flight frequency facilitated by the acceleration of

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[4] Again, about two-thirds of this is due to Southwest Airlines.

[5] See Steven A. Morrison, "Actual, Adjacent, and Potential Competition: Estimating the Full Effect of Southwest Airlines," unpublished manuscript (available in the research section of my website).

[6] The estimate compares actual deregulated fares with an estimate of what fares would be if they continued to be regulated. Of course, one has no way of knowing for sure what regulated fares would be. However, a good guess can be made with an updated version of the fare formula that the CAB used during the last few years of regulation. See Steven A. Morrison and Clifford Winston, *The Evolution of the Airline Industry,* Washington, DC: The Brookings Institution, 1995.

hub-and-spoke operations.[7] Because deregulation freed airlines to serve all markets, travelers have also gained from having to make fewer connections that require changing airlines. These gains have been partially offset by more crowded flights, travel restrictions that are inconvenient for business travelers (especially the required Saturday night stay), a few more connections, and slightly longer flight times because of congestion. Accounting for fare and service quality changes, the annual net benefits to travelers from airline deregulation currently exceed $20 billion.

The Details

The results presented in the previous section indicate that, on average, travelers have benefited from airline deregulation but that a small minority has not. In this section I take a more disaggregate view to try to identify those factors that distinguish the winners from the losers and to identify any trouble spots and possible policy remedies.

To address this question, my colleague Cliff Winston and I used regression analysis to examine the factors that influenced fare changes between 1978:4 and 1998:4 on the 1,000 most heavily traveled routes in 1998.[8] We found that increased competition, especially from Southwest Airlines and other low-fare carriers leads to lower fares. In particular, we found that competition from Southwest Airlines accounted for $9.7 billion of the fare savings since 1978:4. Competition from other low-fare carriers accounted for $1.5 billion, while additional competition from pre-deregulation carriers accounted for $0.4 billion.

In another regression we examined the factors that influence the level of fares (rather than the change in fares) on the same set of routes used above. We found that the most important factor that increases airfares to travelers was (lack of) gate availability. In particular, we found that, other things equal, airports with a higher fraction of gates available for use by other airlines (i.e., generally common use gates) had lower fares. Quantitatively, if all airports had common use gates, or other arrangements that precluded exclusive use of gates by incumbent airlines, travelers would save $3.8 billion annually.

Slots (at O'Hare and LaGuardia) raise fares by $0.6 billion annually.

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[7] Steven A. Morrison and Clifford Winston, *The Evolution of the Airline Industry* provides a detailed discussion of the findings reported in this paragraph. The benefits from increased frequency are nearly as important as the benefits from reduced fares, amounting to more than 80 percent of the benefits from lower fares.

[8] Steven A. Morrison and Clifford Winston, "The Remaining Role of Government Policy in the Deregulated Airline Industry," in Sam Peltzman and Clifford Winston, eds. *The Deregulation of Network Industries: What's Next?*," Washington, DC: The Brookings Institution, 2000 (forthcoming) (available in the research section of my web site).

Domination of hub airports raises fares by $0.4 billion annually, other things equal. Figure 5 sheds additional light on the hub premium issue. The figure shows the percentage by which fares at 12 concentrated airports differ from fares at two sets of control groups. Although the results differ from airport to airport, on average, fares at concentrated hub airports are 23 percent higher than at all other airports. But, as indicated above, the effect of Southwest Airlines on fares is so important, that when the comparison group excludes airports that Southwest serves, the average concentrated airport has fares 6 percent lower than the comparison group.[9] Thus, it appears that what looks like a hub premium is actually a "premium" that airlines charge anywhere they can when they do not compete against Southwest.

On routes where carriers appear to have violated the Department of Transportation's Unfair Exclusionary Practices criteria, fares are lower during the periods when the alleged transgressions are occurring and return to their previous levels after the episodes are over. We found that fares on these routes, before and after the alleged predatory activity, are $20 million higher than on otherwise comparable routes.

Conclusion and Policy Recommendations

By and large, airline markets are working and competition is healthy. There are a few trouble spots, however. By far the most important is access to gates at airports. Slot restrictions are a distant second, followed by hub dominance. The quantitative importance of alleged predatory activity is quite small.

Although competition is robust, more competition would be better. The effect of Southwest Airlines on competition and fares shows that just one airline can have a large impact on competition and fares if it is well financed and well managed. The likelihood of another Southwest entering the industry would be increased if federal limits on foreigners owning and operating U.S.-based airlines were eliminated.

The FAA/OST Task Force[10] has recommended several policies to improve gate availability at airports as has the TRB Committee for a Study of Competition in the U.S. Airline Industry.[11] These range from using the AIP and PFC programs to improve gate

[9] This comparison is potentially misleading because three of the concentrated airports are served by Southwest (Salt Lake City, St. Louis, and Detroit). However, if these three airports are eliminated from the analysis, fares at the nine remaining concentrated airports are 29 percent higher than at all other airports and 1 percent lower than the comparison group that excludes airports served by Southwest.

[10] FAA/OST Task Force, *Airport Business Practices and Their Impact on Airline Competition*, October 1999.

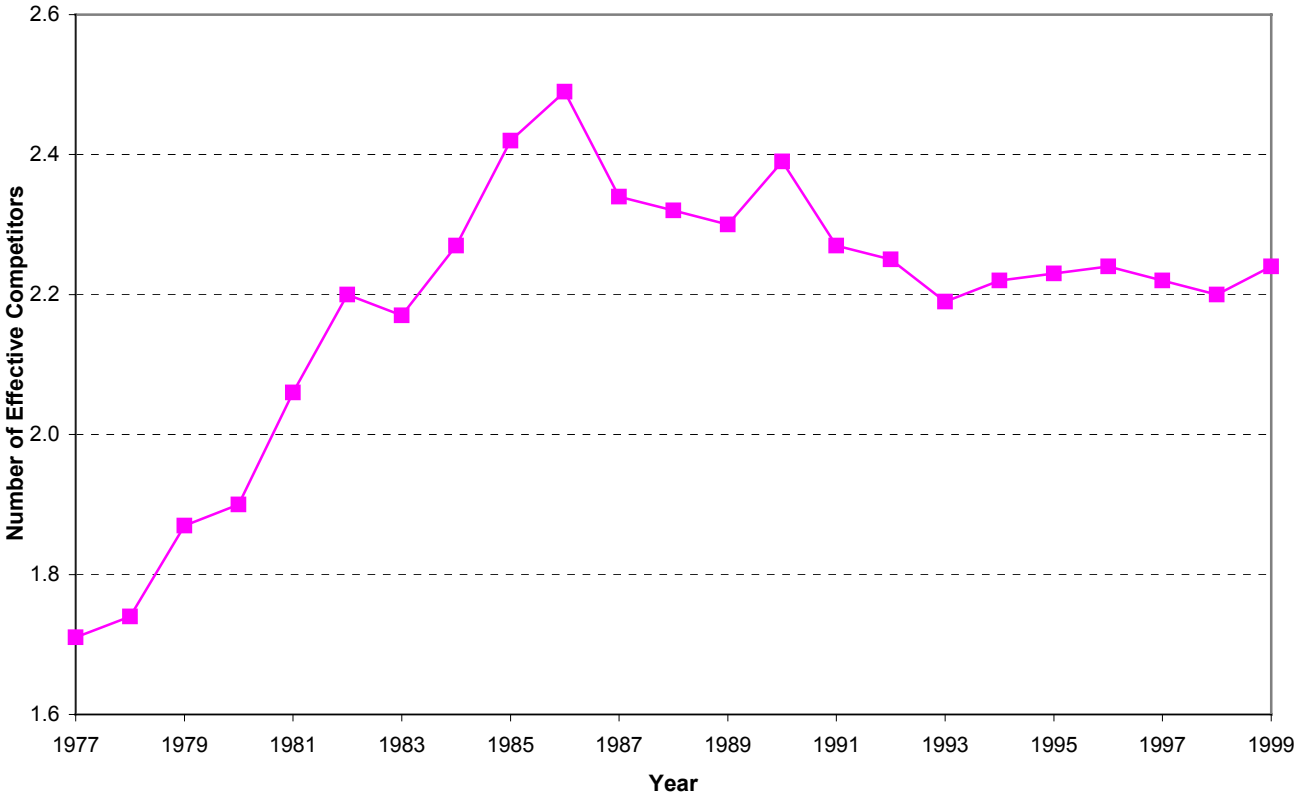
[11] Transportation Research Board, National Research Council, *Entry and Competition in the U.S. Airline Industry*, Special Report 255, Washington, DC: National Academy Press, 1999.

availability to airport authorities buying back gates from dominant incumbents. Although I do not have a particular policy in mind, any policy that improves gate access should have a large impact on competition.

As for slots, I believe they should be eliminated and replaced with congestion-based takeoff and landing fees.

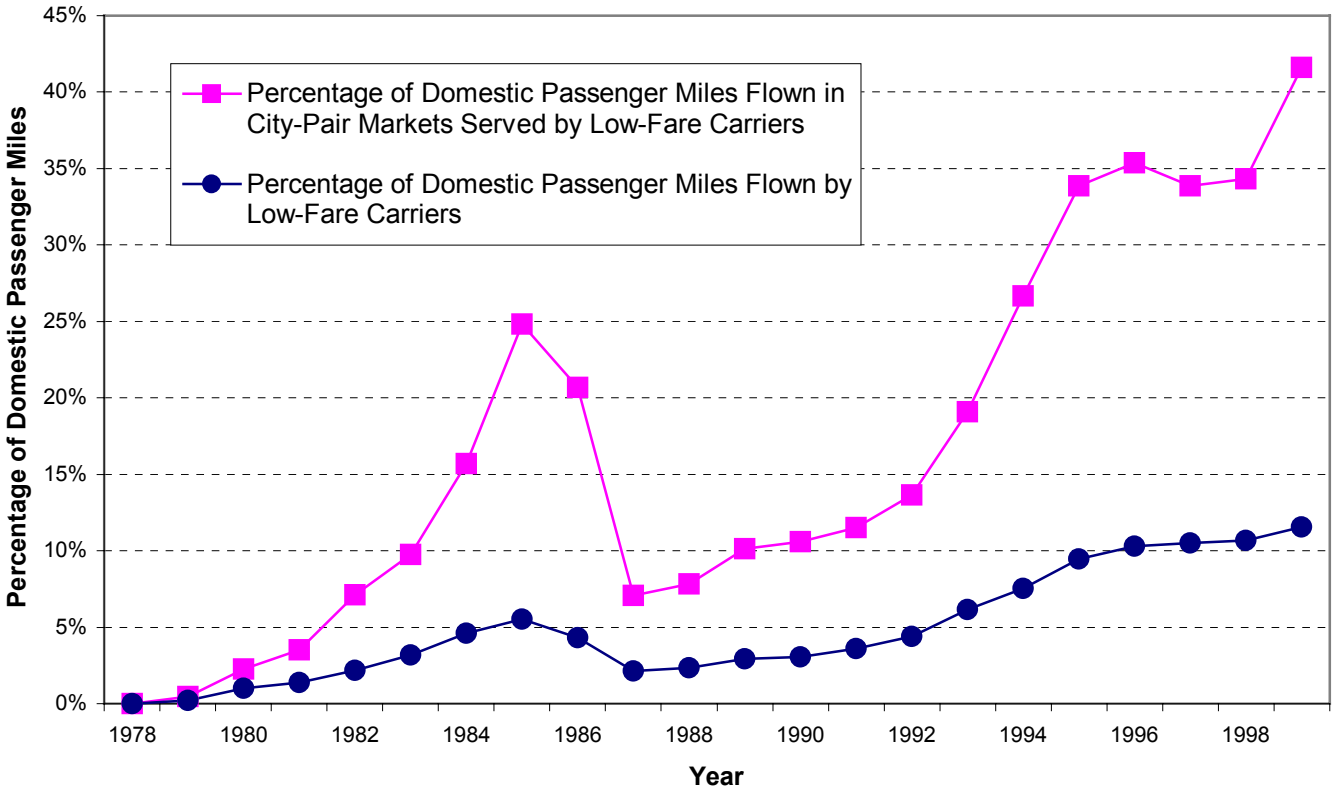
Although I have found that the likely effect of alleged predatory behavior is small, it should not be ignored. In cases of alleged predatory behavior by airlines, I believe the Department of Justice should investigate and take appropriate action, rather than the Department of Transportation.

Figure 1
Competition at the Route Level



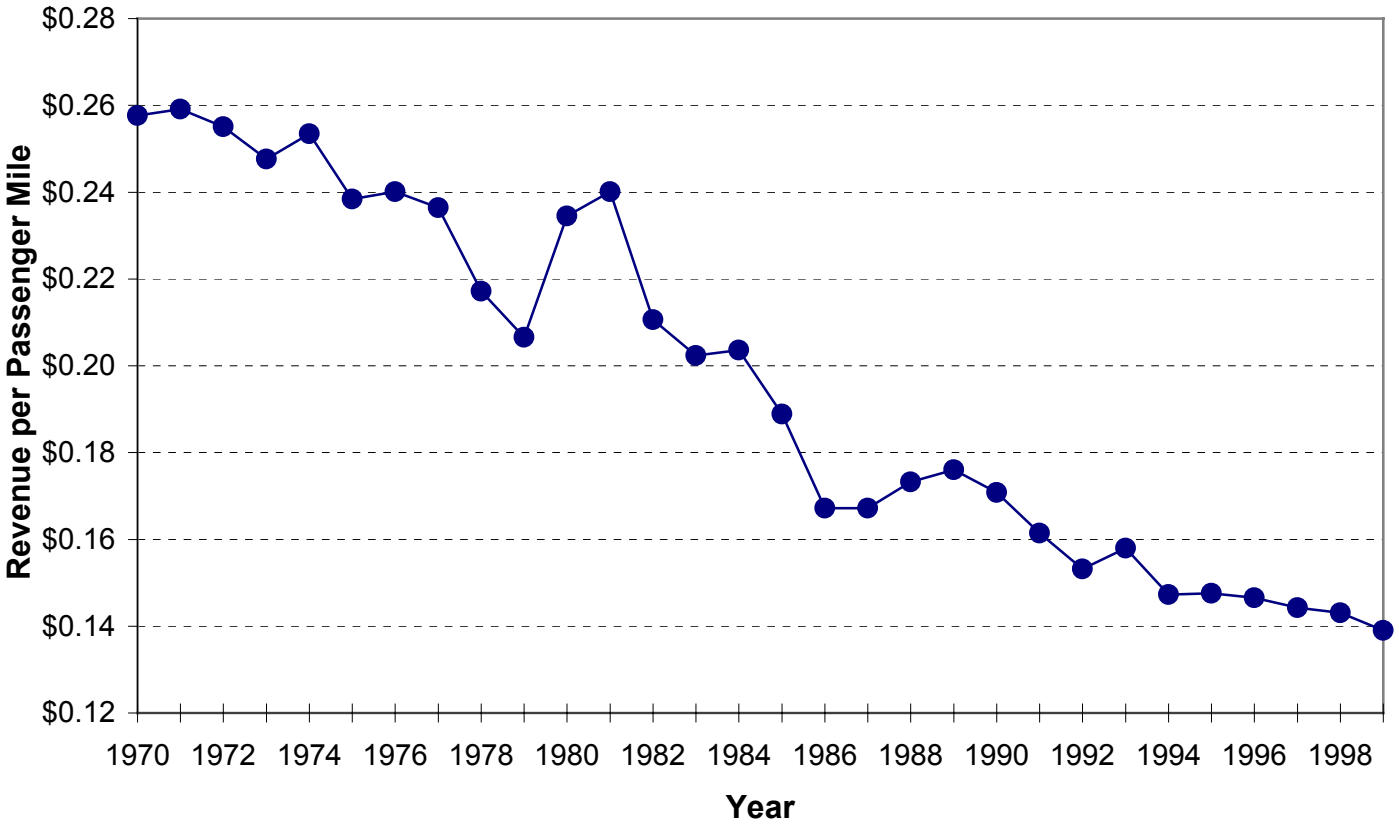
Data Sources and Variable Construction: Author's calculations from data in U.S. Department of Transportation, Data Bank 1A. The data point for 1999 is for the first two quarters only.

Figure 2
The Influence of Low-Fare Carriers



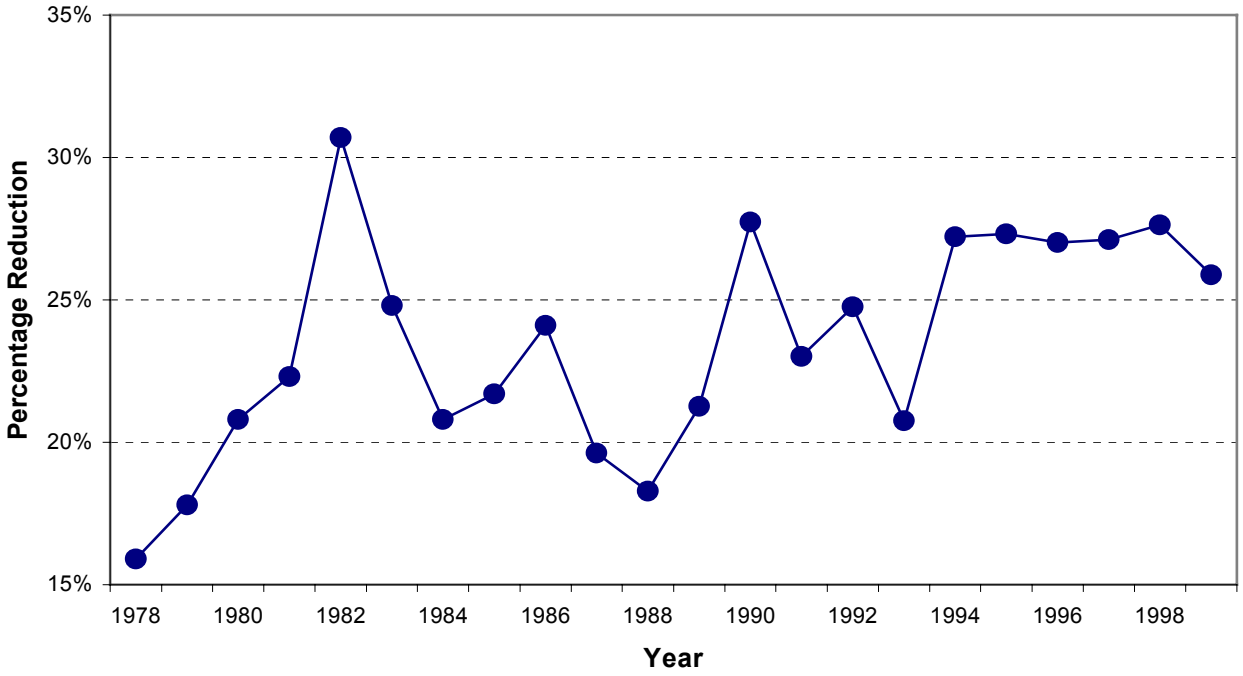
Data Sources and Variable Construction: Author's calculations using data from U.S. Department of Transportation Data Bank 1A, and Form 41. The 1999 data point for Percentage of Domestic Passenger Miles Flown in City-Pair Markets Served by Low-Fare Carriers is for the first and second quarters only.

Figure 3
Domestic Airline Yield Adjusted for Inflation (1999 dollars)



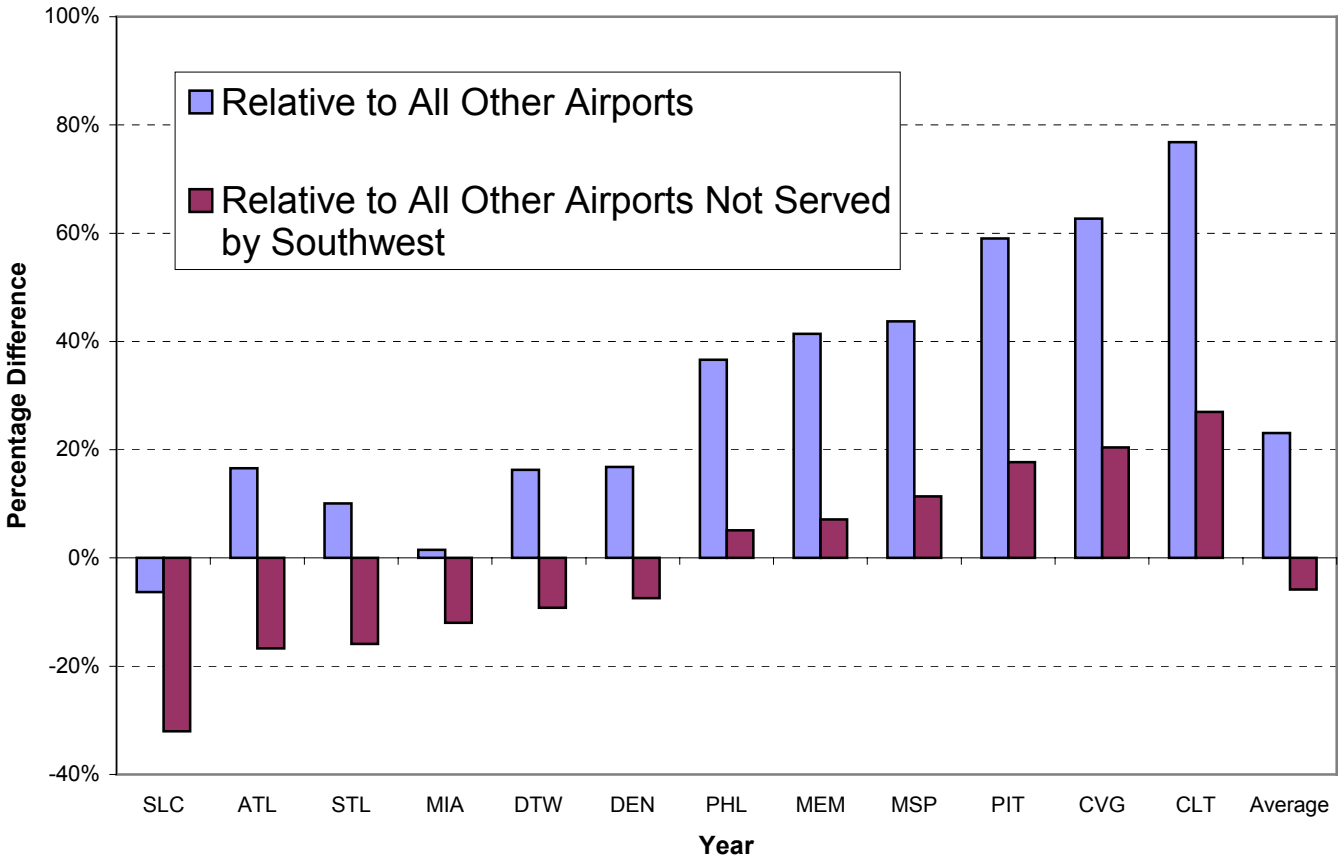
Data Sources and Variable Construction: Author's calculations using yield data from the Air Transport Association (www.air-transport.org) and Consumer Price Index data from the U.S. Bureau of Labor Statistics (www.bls.gov). The figure for 1999 is preliminary.

Figure 4
Percentage Reduction in Fares Relative to Regulated Fares



Data Sources and Variable Construction: Author's calculation. This figure updates the calculation of fare savings in Steven A. Morrison and Clifford Winston, *The Evolution of the Airline Industry,* Washington, DC: The Brookings Institution, 1995. The data point for 1999 is for the first two quarters only.

Figure 5
Domestic Fares at Concentrated Hub Airports in 1998



Data Sources and Variable Construction: Author's calculations using data from the U.S. Department of Transportation, Data Bank 1A. (SLC = Salt Lake City, ATL = Atlanta, STL = St. Louis, MIA = Miami, DTW = Detroit (Wayne County), DEN = Denver, PHL = Philadelphia, MEM = Memphis, MSP = Minneapolis-St. Paul, PIT = Pittsburgh, CVG = Cincinnati, CLT = Charlotte.)